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CORRECTIONS, COMMENTS AND/OR PROCUREMENT

FOR CHARTING ERRORS, OR FOR CHANGES, ADDITIONS, RECOMMENDATIONS ON PROCEDURAL ASPECTS CONTACT:

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Email Questions to: 9-AMC-Chartsales@faa.gov

Frequently asked questions (FAQ) are answered on our website at http://aeronav.faa.gov. See the FAQs prior to contact via toll free number or email.

Request for the creation or revisions to Airport Diagrams should be in accordance with FAA Order 7910.4.

INOPERATIVE COMPONENTS OR VISUAL AIDS TABLE

Landing minimums published on instrument approach procedure charts are based upon full operation of all components and visual aids associated with the particular instrument approach chart being used. Higher minimums are required with inoperative components or visual aids as indicated below. If more than one component is inoperative, each minimum is raised to the highest minimum required by any single component that is inoperative. ILS glide slope inoperative minimums are published on the instrument approach charts as localizer minimums. This table may be amended by notes on the approach chart. Such notes apply only to the particular approach category(ies) as stated. See legend page for description of components indicated below.

(1) ILS, MLS, PAR and RNAV (LPV line of minima)

Inoperative Component or Aid	Approach Category	Increase Visibility
ALSF 1 & 2, MALSR, & SSALR	ABCD	$\frac{1}{4}$ mile

(2) ILS with visibility minimum of 1,800 RVR

ALSF 1 & 2, MALSR, & SSALR	ABCD	To 4000 RVR
TDZL RCLS	ABCD	To 2400 RVR*
RVR	ABCD	To $\frac{1}{2}$ mile

*1800 RVR authorized with the use of FD or AP or HUD to DA.

(3) VOR, VOR/DME, TACAN, LOC, LOC/DME, LDA, LDA/DME, SDF, SDF/DME, GPS, ASR and RNAV (LNAV/VNAV and LNAV line of minima)

Inoperative Visual Aid	Approach Category	Increase Visibility
ALSF 1 & 2, MALSR, & SSALR	ABCD	$\frac{1}{2}$ mile
SSALS,MALS, & ODALS	ABC	$\frac{1}{4}$ mile

(4) NDB

ALSF 1 & 2, MALSR, & SSALR	C	$\frac{1}{2}$ mile
	ABD	$\frac{1}{4}$ mile
MALS, SSALS, ODALS	ABC	$\frac{1}{4}$ mile

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TERMS/LANDING MINIMA DATA
IFR LANDING MINIMA

The United States Standard for Terminal Instrument Procedures (TERPS) is the approved criteria for formulating instrument approach procedures. Landing minima are established for six aircraft approach categories (ABCDE and COPTER). In the absence of COPTER MINIMA, helicopters may use the CAT A minimums of other procedures. The standard format for RNAV minima and landing minima portrayal follows:

RNAV (GPS) MINIMA

CATEGORY	A	B	C	D
LPV DA	1540/24 258 (300-½)			
LNAV/VNAV DA	1600/24 318 (400-½)			1600/40 318 (400-¾)
LNAV MDA	1840/24 558 (600-½)		1840/50 558 (600-1)	1840/60 558 (600-1¼)
CIRCLING	1840-1 545 (600-1)		1840-1½ 545 (600-1½)	1860-2 565 (600-2)

NOTE: The 🅦 symbol indicates outages of the WAAS vertical guidance may occur daily at this location due to initial system limitations. WAAS NOTAMS for vertical outages are not provided for this approach. Use LNAV minima for flight planning at these locations, whether as a destination or alternate. For flight operations at these locations, when the WAAS avionics indicate that LNAV/VNAV or LPV service is available, then vertical guidance may be used to complete the approach using the displayed level of service. Should an outage occur during the procedure, reversion to LNAV minima may be required. As the WAAS coverage is expanded, the 🅦 will be removed.

RNAV minimums are dependent on navigation equipment capability, as stated in the applicable AFM, AFMS, or other FAA approved document, and as outlined below.

GLS (GLobal Navigation Satellite System (GNSS) Landing System)
The GLS (NA) minima line will be removed from existing RNAV (GPS) approach charts when LPV minima is published.

LPV (An Approach Procedure with Vertical Guidance (APV) based on WAAS lateral and vertical guidance)
Must have WAAS avionics approved for LPV approach.

LNAV/VNAV (Lateral navigation/Vertical navigation)
Must have either:
a.) WAAS avionics approved for LNAV/VNAV approach, or
b.) A certified Baro-VNAV system with an IFR approach approved GPS,or
c.) A certified Baro-VNAV system with an IFR approach approved WAAS, or
d.) An approach certified RNP-0.3 system with barometric vertical guidance (Baro-VNAV).
Other RNAV systems require special approval.
NOTES:
1. LNAV-VNAV minima not applicable for Baro-VNAV equipment if chart is annotated "Baro-VNAV NA" or when below the minimum published temperature, e.g., Baro-VNAV NA below -17°C (2°F).
2. DME/DME based RNP-0.3 systems may be used only when a chart note indicates DME/DME availability; e.g., "DME/DME RNP-0.3 Authorized." Specific DME facilities may be required; e.g., "DME/DME RNP-0.3 Authorized. ABC, XYZ required."

LNAV (Lateral navigation)
Must have IFR approach approved GPS, WAAS, or RNP-0.3 system.Other RNAV systems require special approval.
NOTE: DME/DME based RNP-0.3 systems may be used only when a chart note indicates DME/DME availability; e.g., "DME/DME RNP-0.3 Authorized." Specific DME facilities may be required; e.g., "DME/DME RNP-0.3 Authorized. ABC, XYZ required."

LANDING MINIMA FORMAT

In this example airport elevation is 1179, and runway touchdown zone elevation is 1152.

	Visibility (RVR 100's of feet)	Aircraft Approach Category HAT/HATh		

Straight-in ILS to Runway 27

Straight-in with Glide Slope Inoperative or not used to Runway 27

CATEGORY	A	B	C	D
S-ILS 27	1352/24		200 (200-½)	
S-LOC 27	1440/24	288	(300-½)	1440/50 288 (300-1)
CIRCLING	1540-1 361 (400-1)	1640-1 461 (500-1)	1640-1½ 461 (500-1½)	1740-2 561 (600-2)
MDA	HAA	Visibility in Statute Miles		

All weather minimums in parentheses not applicable to Civil Pilots. Military Pilots refer to appropriate regulations.

TERMS/LANDING MINIMA DATA

TERMS/LANDING MINIMA DATA
COPTER MINIMA ONLY

CATEGORY	COPTER		
H-176°	680-½	363	(400-½)

Copter Approach Direction

Height of MDA/DA
Above Landing Area (HAL)

No circling minimums are provided

RADAR MINIMA

	RWY	GS/TCH/RPI	CAT	DA/ MDA-VIS	HAT/ HATh/ HAA	CEIL-VIS	CAT	DA/ MDA-VIS	HAT/ HATh/ HAA	CEIL-VIS
PAR (c)	10	2.5°/42/1000	ABCDE	**195**/16	100	(100-¼)				
(d)	28	2.5°/48/1068	ABCDE	**187**/16	100	(100-¼)		Visibility (RVR 100's of feet)		
ASR	10		ABC	**560**/40	463	(500-¾)	D	**560**/50	463	(500-1)
			E	**580**/60	463	(500-1¼)				
	28		AB	**600**/50	513	(600-1)	C	**600**/60	513	(600-1¼)
			DE	**600**-1½	513	(600-1½)				
CIR (b)	10		AB	**560**-1¼	463	(500-1¼)	C	**560**-1½	463	(500-1½)
	28		AB	**600**-1¼	503	(600-1¼)	C	**600**-1½	503	(600-1½)
	10, 28		DE	**660**-2	563	(600-2)				

Visibility in Statute Miles

All minimums in parentheses not applicable to Civil Pilots. Military Pilots refer to appropriate regulations.

Radar Minima:
1. Minima shown are the lowest permitted by established criteria. Pilots should consult applicable directives for their category of aircraft.
2. The circling MDA and weather minima to be used are those for the runway to which the final approach is flown- not the landing runway. In the above RADAR MINIMA example, a category C aircraft flying a radar approach to runway 10, circling to land on runway 28, must use an MDA of 560 feet with weather minima of 500-1½ .

🔺 Alternate Minimums not standard. Civil users refer to tabulation. USA/USN/USAF pilots refer to appropriate regulations.

🔺NA Alternate minimums are Not Authorized due to unmonitored facility or absence of weather reporting service.

🔻 Take-off Minimums not standard and/or Departure Procedures are published. Refer to tabulation.

AIRCRAFT APPROACH CATEGORIES

Aircraft approach category indicates a grouping of aircraft based on a speed of VREF, if specified, or if VREF not specified, 1.3 VSO at the maximum certificated landing weight. VREF, VSO, and the maximum certificated landing weight are those values as established for the aircraft by the certification authority of the country of registry. Helicopters are Category A aircraft. An aircraft shall fit in only one category. However, if it is necessary to operate at a speed in excess of the upper limit of the speed range for an aircraft's category, the minimums for the category for that speed shall be used. For example, an airplane which fits into Category B, but is circling to land at a speed of 145 knots, shall use the approach Category D minimums. As an additional example, a Category A airplane (or helicopter) which is operating at 130 knots on a straight-in approach shall use the approach Category C minimums. See following category limits:

MANEUVERING TABLE

Approach Category	A	B	C	D	E
Speed (Knots)	0-90	91-120	121-140	141-165	Abv 165

Comparable Values of RVR and Visibility

The following table shall be used for converting RVR to ground or flight visibility. For converting RVR values that fall between listed values, use the next higher RVR value; do not interpolate. For example, when converting 1800 RVR, use 2400 RVR with the resultant visibility of 1/2 mile.

RVR	Visibility (statute miles)	RVR (feet)	Visibility (statute miles)
1600	¼	4500	⅞
2400	½	5000	1
3200	⅝	6000	1¼
4000	¾		

TERMS/LANDING MINIMA DATA

GENERAL INFORMATION

This publication is issued every 56 days and includes Standard Instrument Approach Procedures (SIAPS), Standard Instrument Departures (SIDs), Standard Terminal Arrivals (STARs), IFR Take-off Minimums and (Obstacle) Departure Procedures (ODPs), IFR Alternate Minimums, and Radar Instrument Approach Minimums for use by civil and military aviation. The organization responsible for SIAPs, Radar Minimums, SIDs, STARs and graphic ODPs is identified in parentheses in the top margin of the procedure; e.g., (FAA), (FAA-O), (USA), (USAF), (USN). SIAPS with the (FAA) and (FAA-O) designation are regulated under 14 CFR, Part 97. SIAPs with the (FAA-O) designation have been developed under Other Transaction Agreement (OTA) by private providers and have been certified by the FAA. See 14 CFR, Part 91.175 (a) and the AIM for further details. 14 CFR, Part 91.175 (g) and the Special Notices section of the Airport/Facility Directory contains information on civil operations at military airports.

STANDARD TERMINAL ARRIVALS AND DEPARTURE PROCEDURES

The use of the associated codified STAR/DP and transition identifiers are requested of users when filing flight plans via teletype and are required for users filing flight plans via computer interface. It must be noted that when filing a STAR/DP with a transition, the first three coded characters of the STAR and the last three coded characters of the DP are replaced by the transition code. Examples: ACTON SIX ARRIVAL, file (AQN.AQN6); ACTON SIX ARRIVAL, EDNAS TRANSITION, file (EDNAS.AQN6). FREEHOLD THREE DEPARTURE, file (FREH3.RBV), FREEHOLD THREE DEPARTURE, ELWOOD CITY TRANSITION, file (FREH3.EWC).

RNAV DP and STAR. Effective March 15,2007, these procedures, formerly identified as Type-A and Type-B, will be designated as RNAV 1 in accordance with amended Advisory Circular (AC) and ICAO terminology.

Refer to AC 90-100A U.S. TERMINAL AND EN ROUTE AREA NAVIGATION (RNAV) OPERATIONS and the Aeronautical Information Manual for additional guidance regarding these procedures.

Standard RNAV 1 Procedure Chart Notes

NOTE: RNAV 1
NOTE: DME/DME/IRU or GPS required

Some procedures may require use of GPS and will be identified by a "GPS required" note.

RNAV 1 Procedure Characteristics and Operations

1. Require use of an RNAV system with DME/DME/IRU, and/or GPS inputs.
2. Require use of a CDI, flight director, and/or autopilot, in lateral navigation mode, for flight guidance while operating on RNAV paths (track, course, or direct leg). Other methods providing an equivalent level of performance may be acceptable.
3. RNAV paths may start as low as 500 feet above airport elevation.

PILOT CONTROLLED AIRPORT LIGHTING SYSTEMS

Available pilot controlled lighting (PCL) systems are indicated as follows:
1. Approach lighting systems that bear a system identification are symbolized using negative symbology, e.g., ⬤, ⬤, ⬤
2. Approach lighting systems that do not bear a system identification are indicated with a negative "⬤" beside the name.
A star (★) indicates non-standard PCL, consult Directory/Supplement, e.g., ⬤★
To activate lights, use frequency indicated in the communication section of the chart with a ⬤ or the appropriate lighting system identification e.g., UNICOM 122.8 ⬤, ⬤, ⬤
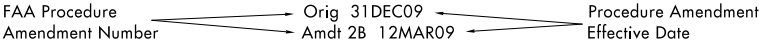
KEY MIKE	FUNCTION
7 times within 5 seconds	Highest intensity available
5 times within 5 seconds	Medium or lower intensity (Lower REIL or REIL-off)
3 times within 5 seconds	Lowest intensity available (Lower REIL or REIL-off)

CHART CURRENCY INFORMATION

Date of Latest Revision   09365

The Date of Latest Revision identifies the Julian date the chart was added or last revised for any reason. The first two digits indicate the year, the last three digits indicate the day of the year (001 to 365/6) in which the latest revision of any kind has been made to the chart.

FAA Procedure	→ Orig 31DEC09 ←	Procedure Amendment
Amendment Number	→ Amdt 2B 12MAR09 ←	Effective Date

The FAA Procedure Amendment Number represents the most current amendment of a given procedure. The Procedure Amendment Effective Date represents the AIRAC cycle date on which the procedure amendment was incorporated into the chart. Updates to the amendment number & effective date represent procedural/criteria revisions to the charted procedure, e.g., course, fix, altitude, minima, etc.

NOTE: Inclusion of the "Procedure Amendment Effective Date" will be phased in as procedures are amended. As this occurs, the Julian date will be relocated to the upper right corner of the chart.

MISCELLANEOUS

★ Indicates a non-continuously operating facility, see A/FD or flight supplement.
"Radar required" on the chart indicates that radar vectoring is required for the approach.
Distances in nautical miles (except visibility in statute miles and Runway Visual Range in hundreds of feet). Runway Dimensions in feet. Elevations in feet. Mean Sea Level (MSL). Ceilings in feet above airport elevation. Radials/ bearings/headings/courses are magnetic. Horizontal Datum: Unless otherwise noted on the chart, all coordinates are referenced to North American Datum 1983 (NAD 83), which for charting purposes is considered equivalent to World Geodetic System 1984 (WGS 84).

Terrain is scaled within the neat lines (planview boundaries) and does not accurately underlie not-to-scale distance depictions or symbols.

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GENERAL INFO
ABBREVIATIONS

ADF	Automatic Direction Finder
AFIS	Automatic Flight Information Service
ALS	Approach Light System
ALSF	Approach Light System with Sequenced Flashing Lights
AP	Autopilot System
APCH	Approach
APP CON	Approach Control
ARR	Arrival
ASOS	Automated Surface Observing System
ASR/PAR	Published Radar Minimums at this Airport
ATIS	Automatic Terminal Information Service
AWOS	Automated Weather Observing System
AZ	Azimuth
BC	Back Course
BND	Bound
C	Circling
CAT	Category
CCW	Counter Clockwise
CDI	Course Deviation Indicator
Chan	Channel
CLNC DEL	Clearance Delivery
CNF	Computer Navigation Fix
CTAF	Common Traffic Advisory Frequency
CW	Clockwise
DA	Decision Altitude
DER	Departure End of Runway
DH	Decision Height
DME	Distance Measuring Equipment
ELEV	Elevation
EMAS	Engineered Material Arresting System
FAF	Final Approach Fix
FD	Flight Director System
FM	Fan Marker
FMS	Flight Management System
GCO	Ground Communications Outlet
GLS	Ground Based Augmentation System Landing System
GPI	Ground Point of Interception
GPS	Global Positioning System
GS	Glide Slope
HAA	Height above Airport
HAL	Height above Landing
HAT	Height above Touchdown
HATh	Height Above Threshold
HGS	Head-up Guidance System
HIRL	High Intensity Runway Lights
HUD	Head-up Display
IAF	Initial Approach Fix
ICAO	International Civil Aviation Organization
IF	Intermediate Fix

IM	Inner Marker
INT	Intersection
LAAS	Local Area Augmentation System
LDA	Localizer Type Directional Aid
Ldg	Landing
LDIN	Lead in Light System
LIRL	Low Intensity Runway Lights
LOC	Localizer
LR	Lead Radial. Provides at least 2 NM (Copter 1 NM) of lead to assist in turning onto the intermediate/final course.
MALS	Medium Intensity Approach Light System
MALSR	Medium Intensity Approach Light System with RAIL
MAP	Missed Approach Point
MDA	Minimum Descent Altitude
MIRL	Medium Intensity Runway Lights
MLS	Microwave Landing System
MM	Middle Marker
N/A	Not Applicable
NA	Not Authorized
NDB	Non-directional Radio Beacon
NFD	National Flight Database
NM	Nautical Mile
NoPT	No Procedure Turn Required (Procedure Turn shall not be executed without ATC clearance)
ODALS	Omnidirectional Approach Light System
ODP	Obstacle Departure Procedure
OM	Outer Marker
PRM	Precision Runway Monitor
R	Radial
RA	Radio Altimeter setting height
RAIL	Runway Alignment Indicator Lights
RCLS	Runway Centerline Light System
REIL	Runway End Identifier Lights
RF	Radius-to-Fix
RNAV	Area Navigation
RNP	Required Navigation Performance
RPI	Runway Point of Intercept(ion)
RRL	Runway Remaining Lights
Rwy	Runway
RVR	Runway Visual Range
S	Straight-in
SALS	Short Approach Light System
SSALR	Simplified Short Approach Light System with RAIL
SDF	Simplified Directional Facility
TAA	Terminal Arrival Area

GENERAL INFO

ABBREVIATIONS

TAC....................................	TACAN
TCH....................................	Threshold Crossing Height (height in feet Above Ground level)
TDZ....................................	Touchdown Zone
TDZE..................................	Touchdown Zone Elevation
TDZ/CL...............................	Touchdown Zone and Runway Centerline Lighting
TDZL..................................	Touchdown Zone Lights
THR....................................	Threshold
THRE..................................	Threshold Elevation
TODA.................................	Take-off Distance Available
TORA.................................	Take-off Run Available
TR......................................	Track
VASI...................................	Visual Approach Slope Indicator
VDP....................................	Visual Descent Point
VGSI..................................	Visual Glide Slope Indicator
WAAS.................................	Wide Area Augmentation System
WP/WPT............................	Waypoint (RNAV)

LEGEND
INSTRUMENT APPROACH PROCEDURES (CHARTS)

PLANVIEW SYMBOLS

TERMINAL ROUTES

Procedure Track

Missed Approach

Visual Flight Path

←165°
345°
Procedure Turn
(Type degree and point of turn optional)

3100 NoPT 5.6 NM to GS Intcpt
045°
(14.2 to LOM)
Minimum Altitude

2000
155°
(15.1)
Feeder Route

Mileage

Penetrates Special Use Airspace

RADIO AIDS TO NAVIGATION

110.1 Underline indicates No Voice transmitted on this frequency

⬡ VOR   ⬡ VOR/DME   ⬡ TACAN   ⬡ VORTAC

NDB   NDB/DME

LOM/LMM (Compass locator at Outer Marker/Middle Marker)

Marker Beacon

Marker beacons that are not specifically part of the procedure but underlie the final approach course are shown in screened color.

Localizer (LOC/LDA) Course
Right side shading- Front course; Left side shading- Back Course

SDF Course

180°
MLS Approach Azimuth

MICROWAVE
Chan 514
M-VDZ
Glidepath 6.20°
DME 111.5 Chan 48(Y)

MLS Identifier

(Y) TACAN must be in "Y" mode to receive distance information.

SCOTT
Chan 59
SKE
(112.2)

VHF Paired Frequency

◉ LOC/DME
⊙ LOC/LDA/SDF/MLS Transmitter
(shown when installation is offset from its normal postion off the end of the runway.)

HOLDING PATTERNS

In lieu of Procedure Turn
270°
(IAS)
090°

Missed Approach
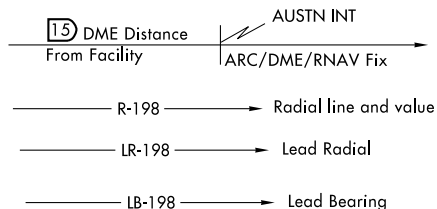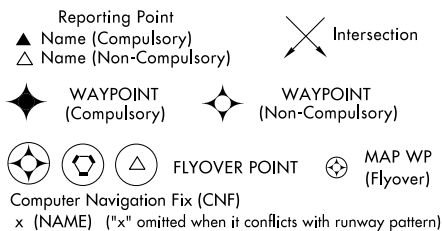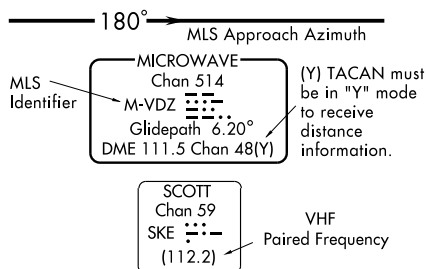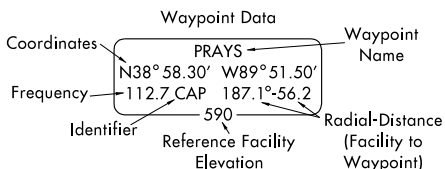360°
180°

Arrival   HOLD 8000
360°
180°

Holding pattern with max. restricted airspeed:
(175K) applies to all altitudes.
(210K) applies to altitudes above 6000' to and including 14000'.
Arrival Holding Pattern altitude restrictions will be indicated when they deviate from the adjacent leg.
Limits will only be specified when they deviate from the standard. DME fixes may be shown.

Waypoint Data

Coordinates
PRAYS
N38° 58.30' W89° 51.50'
112.7 CAP   187.1°-56.2
590
Frequency
Identifier
Reference Facility Elevation

Waypoint Name

Radial-Distance (Facility to Waypoint)

Primary Navaid with Coordinate Values
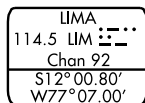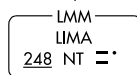
LIMA
114.5 LIM
Chan 92
S12° 00.80'
W77° 07.00'

Secondary Navaid

LMM
LIMA
248 NT

FIXES/ATC REPORTING REQUIREMENTS

Reporting Point
▲ Name (Compulsory)
△ Name (Non-Compulsory)

✕ Intersection

WAYPOINT (Compulsory)

WAYPOINT (Non-Compulsory)

FLYOVER POINT

MAP WP (Flyover)

Computer Navigation Fix (CNF)
x (NAME)   ("x" omitted when it conflicts with runway pattern)

15 DME Distance
From Facility

AUSTN INT
ARC/DME/RNAV Fix

R-198 Radial line and value

LR-198 Lead Radial

LB-198 Lead Bearing

ALTITUDES

5500 Mandatory Altitude
2500 Minimum Altitude
4300 Maximum Altitude

3000 Recommended Altitude
5000 Mandatory Block
3000 Altitude

INDICATED AIRSPEED

175K   120K   250K   180K
Mandatory   Minimum   Maximum   Recommended
Airspeed   Airspeed   Airspeed   Airspeed

LEGEND

INSTRUMENT APPROACH PROCEDURES (CHARTS)

PLANVIEW SYMBOLS

MINIMUM SAFE ALTITUDE (MSA)

Facility Identifier

MSA CRW 25 NM

180°

1500   2200

090° ◇ 270°

4500   2500

360°
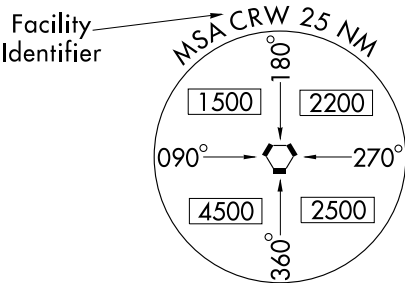
(arrows on distance circle identify sectors)

TERMINAL ARRIVAL AREA (TAA)

210°

2000   4200

15 NM

090° ✧ 270°

Straight-in Area

090° ✧ ✧

2000

360°

Right Base Area

✧ ✧ 270°

1500

360°   12 NM

2000

Left Base Area

MISCELLANEOUS

⌐ VOR Changeover Point

RWY 15 S12° 00.52' End of Rwy Coordinates
W77° 06.91' (DOD only)
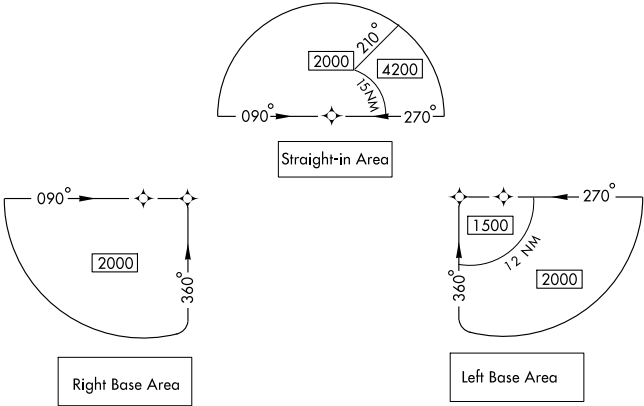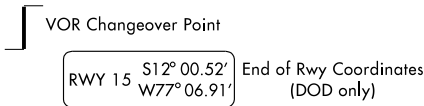
〰〰〰 Distance not to scale

— — — — International Boundary

SPECIAL USE AIRSPACE

▨ R-352

R-Restricted   W-Warning
P-Prohibited   A-Alert

AIRPORTS

▬ ✖ Primary and Secondary (named in planview)

⊕ Seaplane Base

OBSTACLES

• Spot Elevation
∧ Obstacle
�峰 Highest Obstacle

● Highest Spot Elevation
⋀⋀ Group of Obstacles
± Doubtful accuracy
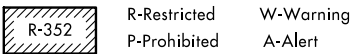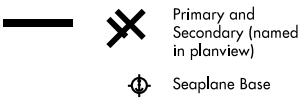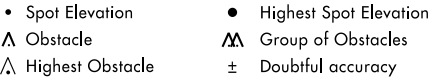
LEGEND

PROFILE VIEW

Two different methods are used for vertical guidance:

a. "GS" indicates an electronic glide slope or barometric vertical guidance is present. In the case of an Instrument Landing System (ILS) and Wide Area Augmentation System (WAAS) LPV approach procedures, an electronic signal provides vertical guidance. Barometric vertical guidance is provided for RNP and LNAV/VNAV instrument approach procedures. All ILS, LPV, RNP, and LNAV/VNAV will be in this format $\frac{GS\ 3.00°}{TCH\ 55}$, located in the lower left or right corner.

b. Other charts without electronic or barometric vertical guidance will be in this format $\frac{3.00°}{TCH\ 55}$, indicating a non-precision vertical descent angle to assist in preventing controlled flight into terrain. On Civil (FAA) procedures, this information is placed above or below the procedure track following the fix it is based on.

ILS or LOC APPROACH

LOM — Procedure Turn (PT) Fix
4000 — PT Fix Altitude until Established Outbound (Some approaches may use a restrictive note)
307°
2156 — Glide Slope Altitude at Outer Marker/FAF
FAF (precision approaches)
PT Completion Altitude
2400 — 127° — FAF (non-precision approaches)
Glide Slope — ILS — Missed Approach Point
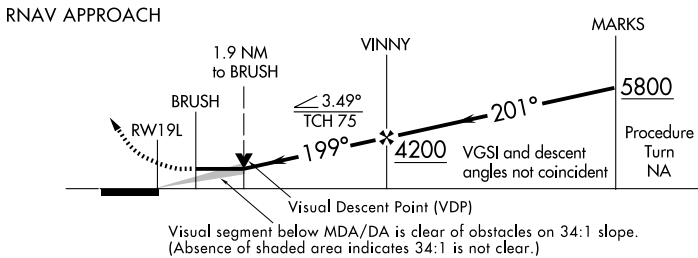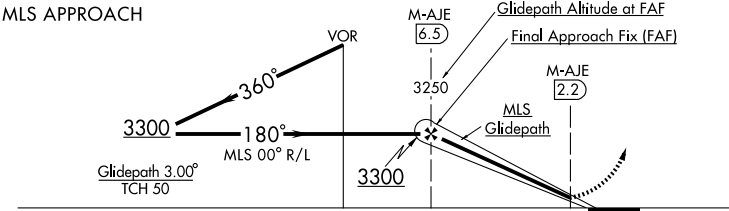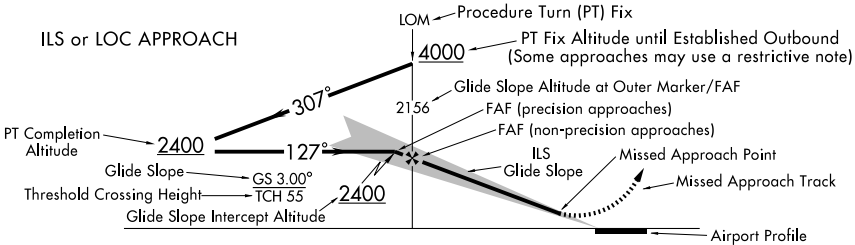$\frac{GS\ 3.00°}{TCH\ 55}$ — Glide Slope — Missed Approach Track
Threshold Crossing Height
2400
Glide Slope Intercept Altitude — Airport Profile

MLS APPROACH

M-AJE ⟨6.5⟩ — Glidepath Altitude at FAF
VOR — Final Approach Fix (FAF)
360°
M-AJE ⟨2.2⟩
3250
3300 — 180° — MLS Glidepath
MLS 00° R/L
$\frac{Glidepath\ 3.00°}{TCH\ 50}$
3300

RNAV APPROACH

MARKS
1.9 NM to BRUSH — VINNY
BRUSH — $\frac{3.49°}{TCH\ 75}$ — 201° — 5800
RW19L — 199° — 4200 — VGSI and descent angles not coincident — Procedure Turn NA
Visual Descent Point (VDP)
Visual segment below MDA/DA is clear of obstacles on 34:1 slope.
(Absence of shaded area indicates 34:1 is not clear.)

NON PRECISION

Vertical Descent Angle (VDA)
VOR ⟨3.3⟩
Threshold Crossing height — $\frac{2.93°}{TCH\ 50}$
VOR ⟨5.8⟩ — 313° — 133°→ — 3000
2400 — ←313° — One Minute Holding Pattern
2.5 NM — 3.3 NM

DESCENT FROM HOLDING PATTERN

VOR — 133°→
←313° — 3000
313°
2400

ALTITUDES

5500	Mandatory Altitude	3000 Recommended Altitude
2500	Minimum Altitude	5000 Mandatory Block
		3000 Altitude
4300	Maximum Altitude	

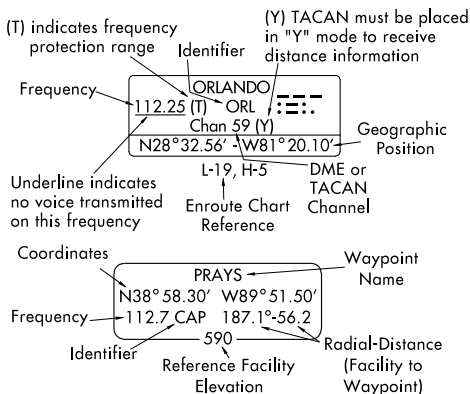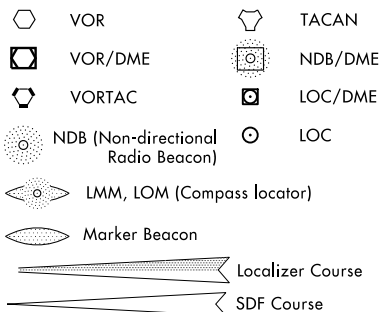**PROFILE SYMBOLS**

Glide Slope/Glide Path Intercept Altitude and final approach fix for vertically guided approach procedures. — 2400

Visual Descent Point (VDP)

■ ■ ■► Visual Flight Path

Note: Facilities and waypoints are depicted as a solid vertical line while fixes and intersections are depicted as a dashed vertical line.

LEGEND

LEGEND
STANDARD TERMINAL ARRIVAL (STAR) CHARTS
DEPARTURE PROCEDURE (DP) CHARTS

RADIO AIDS TO NAVIGATION

VOR

TACAN

VOR/DME

NDB/DME

VORTAC

LOC/DME

NDB (Non-directional Radio Beacon)

LOC

LMM, LOM (Compass locator)

Marker Beacon

Localizer Course

SDF Course

(T) indicates frequency protection range

Identifier

(Y) TACAN must be placed in "Y" mode to receive distance information

Frequency

ORLANDO
112.25 (T) ORL
Chan 59 (Y)
N28°32.56' - W81°20.10'
L-19, H-5

Geographic Position

DME or TACAN Channel

Underline indicates no voice transmitted on this frequency

Enroute Chart Reference

Coordinates

PRAYS
N38°58.30' W89°51.50'
112.7 CAP   187.1°-56.2
590

Waypoint Name

Frequency

Identifier

Reference Facility Elevation

Radial-Distance (Facility to Waypoint)

FIXES/ATC REPORTING REQUIREMENTS

Reporting Points
N00° 00.00'
W00° 00.00'

75 DME Mileage (when not obvious)

▲ Fix-Compulsory and
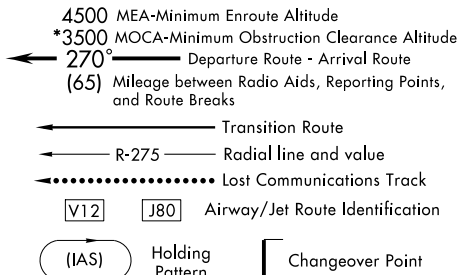△ Non-Compulsory Position Report

→ | DME fix

〰〰〰 Distance not to scale

◆ WAYPOINT (Compulsory)

◇ WAYPOINT (Non-Compulsory)

FLYOVER POINT

X Mileage Breakdown/ Computer Navigation Fix (CNF)
N00° 00.00'
W00° 00.00'

ROUTES

4500 MEA-Minimum Enroute Altitude
*3500 MOCA-Minimum Obstruction Clearance Altitude
←270° Departure Route - Arrival Route
(65) Mileage between Radio Aids, Reporting Points, and Route Breaks

——— Transition Route

← R-275 ——— Radial line and value

•••••••••••••• Lost Communications Track

V12 J80 Airway/Jet Route Identification

(IAS) Holding Pattern Changeover Point

Holding pattern with max. restricted airspeed (175K) applies to all altitudes
(210K) applies to altitudes above 6000' to and including 14000'

SPECIAL USE AIRSPACE

R-352 R-Restricted   W-Warning
P-Prohibited   A-Alert

ALTITUDES

5500 2300 4800
Mandatory Altitude (Cross at)   Minimum Altitude (Cross at or above)   Maximum Altitude (Cross at or below)

⌐ Altitude change at other than Radio Aids

CROSSING ALTITUDES

ATC altitude restriction

5500 (ATC) 2300 (ATC) 4800 (ATC)
4300 1700 3000
Minimum required altitude

INDICATED AIRSPEED

175K 120K 250K 180K
Mandatory Airspeed   Minimum Airspeed   Maximum Airspeed   Recommended Airspeed

AIRPORTS

◇ Civil   ◎ Military   ⊕ Civil-Military   Joint

NOTES

All mileages are nautical.
★ Indicates a non-continuously operating facility, see A/FD or flight supplement.
All radials, bearings are magnetic.
All altitudes/elevations are in feet-MSL.
MRA- Minimum Reception Altitude.
MAA- Maximum Authorized Altitude.
(NAME2.NAME) - Example of DP flight plan Computer Code.
(NAME.NAME2) - Example of STAR flight plan Computer Code.
SL-0000 (FAA) - Example of a chart reference number.
▼ Take-Off Minimums not standard and/or Departure Procedures are published.

AIRPORT DIAGRAM/AIRPORT SKETCH

Runways

Hard Surface	Other Than Hard Surface	Stopways,Taxiways, Parking Areas, Water Runways	Displaced Threshold

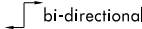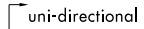|			
Closed Runway	Closed Taxiway	Under Construction	Metal Surface

ARRESTING GEAR: Specific arresting gear systems; e.g., BAK12, MA-1A etc., shown on airport diagrams, not applicable to Civil Pilots. Military Pilots refer to appropriate DOD publications.

⌐ uni-directional   ⌐ bi-directional   ⌇ Jet Barrier

ARRESTING SYSTEM [   ]

REFERENCE FEATURES

Buildings..■
Tanks..●
Obstructions..Λ
Airport Beacon #..☆
Runway
Radar Reflectors...⊼
Hot Spot ....○
Control Tower #...TWR
                                                                    ▪

When Control Tower and Rotating Beacon are co-located, Beacon symbol will be used and further identified as TWR.

Runway length depicted is the physical length of the runway (end-to-end, including displaced thresholds if any) but excluding areas designated as stopways.

A **D** symbol is shown to indicate runway declared distance information available, see appropriate A/FD, Alaska or Pacific Supplement for distance information.

Runway Weight Bearing Capacity/or PCN Pavement Classification Number is shown as a codified expression.
Refer to the appropriate Supplement/Directory for applicable codes e.g.,
RWY 14-32 PCN 80 F/D/X/U S-75, D-185, 2S-175, 2D-325

Helicopter Alighting Areas ⊕ ⊞ ⊟ ⚠ ⊞

Negative Symbols used to identify Copter Procedures
landing point.....................● ⊞ ⊟ ▲ ⊞
Runway Threshold elevation............THRE 123
Runway TDZ elevation....................TDZE 123
                                    ←— 0.3% DOWN
Runway Slope.................................0.8% UP —→
(shown when runway slope is greater than or equal to 0.3%)
NOTE:
Runway Slope measured to midpoint on runways 8000 feet or longer.

◉ U.S. Navy Optical Landing System (OLS) "OLS" location is shown because of its height of approximately 7 feet and proximity to edge of runway may create an obstruction for some types of aircraft.

Approach light symbols are shown in the Flight Information Handbook.
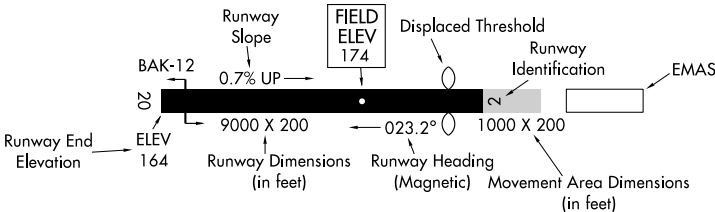
Airport diagram scales are variable.

True/magnetic North orientation may vary from diagram to diagram

Coordinate values are shown in 1 or ½ minute increments. They are further broken down into 6 second ticks, within each 1 minute increments.

Positional accuracy within ±600 feet unless otherwise noted on the chart.

NOTE:
All new and revised airport diagrams are shown referenced to the World Geodetic System (WGS) (noted on appropriate diagram), and may not be compatible with local coordinates published in FLIP. (Foreign Only)

Runway Slope / FIELD ELEV 174 / Displaced Threshold
BAK-12 / 0.7% UP —→ / Runway Identification / EMAS
20 / ● / 2
9000 X 200 / ←— 023.2° / 1000 X 200
Runway End Elevation / ELEV 164 / Runway Dimensions (in feet) / Runway Heading (Magnetic) / Movement Area Dimensions (in feet)

SCOPE

Airport diagrams are specifically designed to assist in the movement of ground traffic at locations with complex runway/taxiway configurations and provide information for updating Computer Based Navigation Systems (I.E., INS, GPS) aboard aircraft. Airport diagrams are not intended to be used for approach and landing or departure operations. For revisions to Airport Diagrams: Consult FAA Order 7910.4.

LEGEND

Approach lighting and visual glide slope systems are indicated on the airport sketch by an identifier, e.g.,(A2), (V), etc.
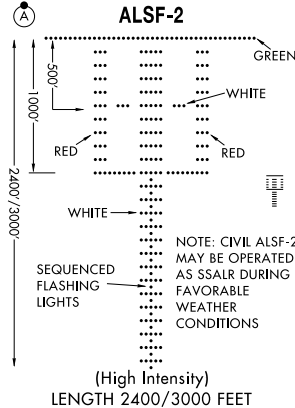
A dot " ● " portrayed with approach lighting letter identifier indicates sequenced flashing lights (F) installed with the approach lighting system e.g., (A1). Negative symbology, e.g., ⊕1, ▼ indicates Pilot Controlled Lighting (PCL).
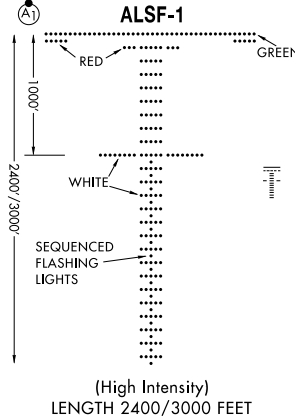
RUNWAY TOUCHDOWN ZONE AND CENTERLINE LIGHTING SYSTEMS

TDZ/CL

RUNWAY CENTERLINE LIGHTS

CL

TDZL

TDZL

TDZ
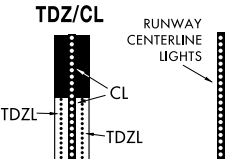
AVAILABILITY of TDZ/CL will be shown by NOTE in SKETCH e.g. "TDZ/CL Rwy 15"

APPROACH LIGHTING SYSTEM

Ⓐ
ALSF-2

GREEN

WHITE

RED   RED

WHITE

SEQUENCED FLASHING LIGHTS

NOTE: CIVIL ALSF-2 MAY BE OPERATED AS SSALR DURING FAVORABLE WEATHER CONDITIONS

(High Intensity)
LENGTH 2400/3000 FEET

APPROACH LIGHTING SYSTEM

Ⓐ1
ALSF-1

RED   GREEN

WHITE

SEQUENCED FLASHING LIGHTS
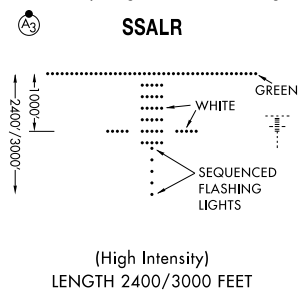
(High Intensity)
LENGTH 2400/3000 FEET

SHORT APPROACH LIGHTING SYSTEM

Ⓐ2

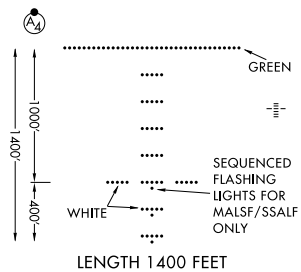### SALS/SALSF
(High Intensity)

SAME AS INNER 1500' OF ALSF-1

SIMPLIFIED SHORT APPROACH LIGHTING SYSTEM
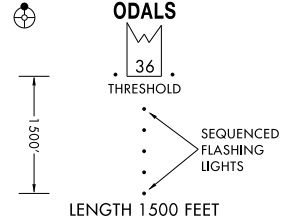with Runway Alignment Indicator Lights

Ⓐ3
SSALR

GREEN

WHITE

SEQUENCED FLASHING LIGHTS

(High Intensity)
LENGTH 2400/3000 FEET

MEDIUM INTENSITY (MALS and MALSF) OR SIMPLIFIED SHORT (SSALS and SSALF) APPROACH LIGHTING SYSTEMS

Ⓐ4

GREEN

WHITE

SEQUENCED FLASHING LIGHTS FOR MALSF/SSALF ONLY

LENGTH 1400 FEET

MEDIUM INTENSITY APPROACH LIGHTING SYSTEM
with Runway Alignment Indicator Lights

Ⓐ5
MALSR

SAME LIGHT CONFIGURATION AS SSALR.

OMNIDIRECTIONAL APPROACH LIGHTING SYSTEM
ODALS

36
THRESHOLD

SEQUENCED FLASHING LIGHTS

LENGTH 1500 FEET
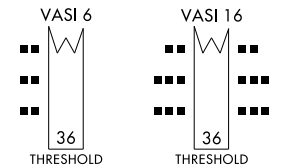
VISUAL APPROACH SLOPE INDICATOR

VASI

VISUAL APPROACH SLOPE INDICATOR WITH STANDARD THRESHOLD CLEARANCE PROVIDED.
ALL LIGHTS WHITE —— TOO HIGH
FAR LIGHTS RED —— ON GLIDE SLOPE
NEAR LIGHTS WHITE
ALL LIGHTS RED —— ·TOO LOW

VASI 2   VASI 4

36   36
THRESHOLD   THRESHOLD

VASI 12

36
THRESHOLD

VISUAL APPROACH SLOPE INDICATOR

Ⓥ3

VASI

VISUAL APPROACH SLOPE INDICATOR WITH A THRESHOLD CROSSING HEIGHT TO ACCOMODATE LONG BODIED OR JUMBO AIRCRAFT.

VASI 6   VASI 16

36   36
THRESHOLD   THRESHOLD

Approach lighting and visual glide slope systems are indicated on the airport sketch by an identifier, Ⓐ2 , Ⓥ etc.

A dot " ● " portrayed with approach lighting letter identifier indicates sequenced flashing lights (F) installed with the approach lighting system e.g., Ⓐ1. Negative symbology, e.g., ⊗1 , ❤ indicates Pilot Controlled Lighting (PCL).

Ⓟ
PRECISION APPROACH PATH INDICATOR
PAPI

Too low   Slightly low

On correct approach path

Slightly high   Too high

Legend: □ White ■ Red

Ⓥ1
"T"-VISUAL APPROACH SLOPE INDICATOR
"T"-VASI

"T" ON BOTH SIDES OF RWY ALL LIGHTS VARIABLE WHITE. CORRECT APPROACH SLOPE- ONLY CROSS BAR VISIBLE. UPRIGHT "T"- FLY UP. INVERTED "T"- FLY DOWN. RED "T"- GROSS UNDERSHOOT.

Ⓥ2
PULSATING VISUAL APPROACH SLOPE INDICATOR
PVASI

Pulsating White
Above Glide Path
Steady, White or Alternating Red/White
On Glide Path
Below Glide Path
Pulsating Red

Threshold

CAUTION: When viewing the pulsating visual approach slope indicators in the pulsating white or pulsating red sectors, it is possible to mistake this lighting aid for another aircraft or a ground vehicle. Pilots should exercise caution when using this type of system.

Ⓥ4
TRI-COLOR VISUAL APPROACH SLOPE INDICATOR
TRCV

Amber
Above Glide Path
Green → Amber
On Glide Path
Red
Below Glide Path

CAUTION: When the aircraft descends from green to red, the pilot may see a dark amber color during the transition from green to red.

Ⓥ5
ALIGNMENT OF ELEMENTS SYSTEMS
APAP

Above glide path   On Glide Path   Below Glide Path

Painted panels which may be lighted at night. To use the system the pilot positions the aircraft so the elements are in alignment.

02 JUN 2011 to 30 JUN 2011

LEGEND

MLS CHANNELING AND FREQUENCY PAIRING TABLE

MLS CHANNEL	VHF FREQUENCY	TACAN CHANNEL	MLS CHANNEL	VHF FREQUENCY	TACAN CHANNEL	MLS CHANNEL	VHF FREQUENCY	TACAN CHANNEL
500	108.10	18X	568	109.45	31Y	636	114.15	88Y
502	108.30	20X	570	109.55	32Y	638	114.25	89Y
504	108.50	22X	572	109.65	33Y	640	114.35	90Y
506	108.70	24X	574	109.75	34Y	642	114.45	91Y
508	108.90	26X	576	109.85	35Y	644	114.55	92Y
510	109.10	28X	578	109.95	36Y	646	114.65	93Y
512	109.30	30X	580	110.05	37Y	648	114.75	94Y
514	109.50	32X	582	110.15	38Y	650	114.85	95Y
516	109.70	34X	584	110.25	39Y	652	114.95	96Y
518	109.90	36X	586	110.35	40Y	654	115.05	97Y
520	110.10	38X	588	110.45	41Y	656	115.15	98Y
522	110.30	40X	590	110.55	42Y	658	115.25	99Y
524	110.50	42X	592	110.65	43Y	660	115.35	100Y
526	110.70	44X	594	110.75	44Y	662	115.45	101Y
528	110.90	46X	596	110.85	45Y	664	115.55	102Y
530	111.10	48X	598	110.95	46Y	666	115.65	103Y
532	111.30	50X	600	111.05	47Y	668	115.75	104Y
534	111.50	52X	602	111.15	48Y	670	115.85	105Y
536	111.70	54X	604	111.25	49Y	672	115.95	106Y
538	111.90	56X	606	111.35	50Y	674	116.05	107Y
540	108.05	17Y	608	111.45	51Y	676	116.15	108Y
542	108.15	18Y	610	111.55	52Y	678	116.25	109Y
544	108.25	19Y	612	111.65	53Y	680	116.35	110Y
546	108.35	20Y	614	111.75	54Y	682	116.45	111Y
548	108.45	21Y	616	111.85	55Y	684	116.55	112Y
550	108.55	22Y	618	111.95	56Y	686	116.65	113Y
552	108.65	23Y	620	113.35	80Y	688	116.75	114Y
554	108.75	24Y	622	113.45	81Y	690	116.85	115Y
556	108.85	25Y	624	113.55	82Y	692	116.95	116Y
558	108.95	26Y	626	113.65	83Y	694	117.05	117Y
560	109.05	27Y	628	113.75	84Y	696	117.15	118Y
562	109.15	28Y	630	113.85	85Y	698	117.25	119Y
564	109.25	29Y	632	113.95	86Y			
566	109.35	30Y	634	114.05	87Y			

TABLE OF CONTENTS

CORRECTIONS, COMMENTS AND/OR PROCUREMENT

FOR CHARTING ERRORS, OR FOR CHANGES, ADDITIONS, RECOMMENDATIONS ON PROCEDURAL ASPECTS CONTACT:

FAA, National Aeronautical Navigation Services
SSMC-4, Sta. #4259
1305 East West Highway
Silver Spring, MD 20910-3281
Telephone 1-800-626-3677
Email 9-AMC-Aerochart@faa.gov

FOR PROCUREMENT CONTACT:

FAA, National Aeronautical Navigation Services
REDIS/Distribution Team
10201 Good Luck Road
Glenn Dale, MD 20769-9700
Online at http://aeronav.faa.gov
Email 9-AMC-Chartsales@faa.gov
Telephone 1-800-638-8972
Fax 301-436-6829
or any authorized chart agent

Frequently asked questions (FAQ) are answered on our website at http://aeronav.faa.gov. See the FAQs prior to contact via toll free number or email.

Request for the creation or revisions to Airport Diagrams should be in accordance with FAA Order 7910.4.

PAC

CLIMB/DESCENT TABLE 10042

INSTRUMENT TAKEOFF OR APPROACH PROCEDURE CHARTS
RATE OF CLIMB/DESCENT TABLE
(ft. per min)

A rate of climb/descent table is provided for use in planning and executing climbs or descents under known or approximate ground speed conditions. It will be especially useful for approaches when the localizer only is used for course guidance. A best speed, power, altitude combination can be programmed which will result in a stable glide rate and altitude favorable for executing a landing if minimums exist upon breakout. Care should always be exercised so that minimum descent altitude and missed approach point are not exceeded.

CLIMB/DESCENT ANGLE (degrees and tenths)	ft/NM	GROUND SPEED (knots)										
		60	90	120	150	180	210	240	270	300	330	360
2.0	210	210	320	425	530	635	743	850	955	1060	1165	1275
2.5	265	265	400	530	665	795	930	1060	1195	1325	1460	1590
2.7	287	287	430	574	717	860	1003	1147	1290	1433	1576	1720
2.8	297	297	446	595	743	892	1041	1189	1338	1486	1635	1783
2.9	308	308	462	616	770	924	1078	1232	1386	1539	1693	1847
3.0	318	318	478	637	797	956	1115	1274	1433	1593	1752	1911
3.1	329	329	494	659	823	988	1152	1317	1481	1646	1810	1975
3.2	340	340	510	680	850	1020	1189	1359	1529	1699	1869	2039
3.3	350	350	526	701	876	1052	1227	1402	1577	1752	1927	2103
3.4	361	361	542	722	903	1083	1264	1444	1625	1805	1986	2166
3.5	370	370	555	745	930	1115	1300	1485	1670	1860	2045	2230
4.0	425	425	640	850	1065	1275	1490	1700	1915	2125	2340	2550
4.5	480	480	715	955	1195	1435	1675	1915	2150	2390	2630	2870
5.0	530	530	795	1065	1330	1595	1860	2125	2390	2660	2925	3190
5.5	585	585	880	1170	1465	1755	2050	2340	2635	2925	3220	3510
6.0	640	640	960	1275	1595	1915	2235	2555	2875	3195	3510	3830
6.5	690	690	1040	1385	1730	2075	2425	2770	3115	3460	3805	4155
7.0	745	745	1120	1490	1865	2240	2610	2985	3355	3730	4105	4475
7.5	800	800	1200	1600	2000	2400	2800	3200	3600	4000	4400	4800
8.0	855	855	1280	1710	2135	2560	2990	3415	3845	4270	4695	5125
8.5	910	910	1360	1815	2270	2725	3180	3630	4085	4540	4995	5450
9.0	960	960	1445	1925	2405	2885	3370	3850	4330	4810	5295	5775
9.5	1015	1015	1525	2035	2540	3050	3560	4065	4575	5085	5590	6100
10.0	1070	1070	1605	2145	2680	3215	3750	4285	4820	5355	5890	6430

Note: rows 2.7 through 3.4 are marked as VERTICAL PATH ANGLE.